MCBSF 1.2

Mailing address:
P.O. Box 3048
Portland, Oregon 97203

Location:
6900 North Edgewater Street
Portland, Oregon 97203
(503) 286-8394 Telex 36-0955

WOOD DESERVES PRESERVING

McCORMICK & BAXTER
CREOSOTING CO.

April 3, 1984

Department of Environmental Quality
P.G. Box 1760
Portland, Oregon 97207

Attention: Tom Bispham, Manager, Northwest Region

Gentlemen:

The attached report prepared by our environmental consultant, CH2M HILL, presents the results of the groundwater, surface water, and soil sampling conducted at our Portland plant in November 1983 and January 1984. The report includes our proposed plan for additional site investigation. We hope to implement this plan upon review by the DEQ.

Should you have any questions regarding our proposed plan, please contact either Jack Payne with CH2M HILL or me.

Sincerely,

Chas. R. McCormick III
President

Attachment

PDC956.029.1

PRELIMINARY SITE INVESTIGATION
OF
McCORMICK & BAXTER CREOSOTING COMPANY PLANT

McCORMICK & BAXTER CREOSOTING COMPANY
6900 North Edgewater Street
Portland, Oregon 97203

Submitted by
CH2M HILL
April 3, 1984

McCORMICK & BAXTER CREOSOTING COMPANY
PORTLAND, OREGON
SITE INVESTIGATION

INTRODUCTION

McCormick & Baxter Creosoting Company initiated a preliminary site investigation program in September 1983 to assess the Portland plant's potential environmental impact. The preliminary investigation conducted by Aqua Resources consisted of installing four onsite soil borings/groundwater monitoring wells. The results from one of the wells raised questions regarding potential offsite environmental quality. McCormick & Baxter then obtained the services of CH2M HILL to review the initial results; to collect additional data to supplement the preliminary investigation; and to develop a comprehensive plan for assessing the plant's potential contribution to surface water, groundwater, and soil contamination. McCormick & Baxter notified the Department of Environmental Quality (DEQ) of this plan by telephone, followed by a letter dated December 23, 1983.

This report presents the results of the groundwater, surface water, and soil sampling conducted at the Portland plant in November 1983 and January 1984, together with a proposed plan for additional site investigations to address areas of concern. The report also summarizes previous measures taken by McCormick & Baxter to eliminate the potential for process water and waste residue release to the environment.

HISTORY OF SITE AND PLANT OPERATION

McCormick & Baxter's Portland plant is built on fill material dredged from the Willamette River in the early 1900's (around 1912). A portion of the site was originally

occupied by the Peninsula Lumber Mill, a sawmill operation. McCormick & Baxter's original wood preservation plant began operation in the fall of 1945.

A review of the Portland plant's files and old plant photographs, together with discussions with employees, indicates that the facility's storage tanks, retorts, settlers, etc., have remained confined to the present process area. There is no evidence of abandoned storage or process equipment.

Process water is supplied by two onsite wells. The location of the wells is shown on Drawing No. 1. The oldest well, constructed in 1945, now serves as a backup and is approximately 130 feet deep. The second well, constructed in February 1968, is the primary source of water and is approximately 95 feet deep. Another well was constructed in 1967, but it was abandoned and backfilled in 1968 because of insufficient yield. The drilled depth of the abandoned well was 219 feet. The wells are drilled in sand and gravel aquifers. There was no evidence of any basalt bedrock to a depth of 219 feet. Copies of State Engineer well records and water well reports for these wells are included at the end of this report.

Fire protection water is provided by the City of Portland. Three septic tank drain systems are onsite at the main office, the laboratory, and at the middle process area. Process wastewater is not discharged to the river. Noncontact condenser cooling water from the boiler is discharged directly to the river in accordance with McCormick and Baxter's NPDES permit. The plant is not connected to the City of Portland sewer system.

Initial processing operations at the site began in 1945. Pentachlorophenol was first used at the plant in 1953.

Waterborne treatment began in 1954. Drawing No. 1 shows the present process facilities. A review of McCormick & Baxter's files showed that the following chemicals are now being used at the Portland plant.

- Penta (pentachlorophenol + medium aromatic oil)
- Creosote
- LP gas (penta + isopropyl ether + liquid butane)
- Isopropyl ether
- Chemonite (copper arsenic solution + aqueous ammonia)

The following is a list of chemicals whose use has been discontinued at the Portland plant.

- Pyresote (fire retardant, ammonium sulfate, boric acid, zinc chloride, sodium bicarbonate)
- UCON synthetic oil
- Water repellent penta (mineral spirits, penta, pine oil)
- Chrome (discontinued in 1970)

Process and/or procedural changes initiated at McCormick & Baxter's Portland plant over the past 15 years to eliminate or reduce waste accumulation or discharge are listed below.

- 1969--Isolated process water, installed evaporator; no further process water discharged to river.

- 1969--Converted lumber kiln for the purpose of drying poles, which reduced the amount of process water produced.

- 1970--Discontinued use of surface lagoon (old waste dump site); rerouted boiler blowdown to evaporator.

- 1971--Increased capacity of black oil settlers to provide better oil/water separation, which resulted in less sludge accumulation in evaporator.

- 1971--Discontinued use of water storage for treated materials and barkies.

- 1972--Installed kiln to dry poles and piling, which resulted in further reduction of process water produced in boultonizing process.

- 1972--Installed 400- to 500-foot containment boom at stiff-leg area where, on occasion, oil bubbles are seen on the river surface during summer periods of low water. The area is periodically cleared using a boom boat and absorbent pads.

- 1974--Used stabilite compound to greatly reduce or prevent the carbonization of penta treating solutions, which resulted in a decrease in sludge accumulation and a cleaner treated wood product.

- 1976--Developed spill prevention control and countermeasure plan.

- 1980--Isolated chemonite treating facilities--i.e., solutions, storage, mixer, and makeup water coming from steaming processes. This process water formerly went to settlers and then to the evaporator.

- 1981--Completed hazardous waste storage shed with drum filling and manifesting procedures established.

- 1983--Changed treating cycle for treatment of chemonite lumber using a higher percentage of NH_3 content in solution, prolonged vacuum, and steaming periods to greatly reduce or eliminate surface deposits on treated lumber. This increased treatment cycle time 30 to 35 percent.

- 1983--Installed an additional 42,000-gallon holding capacity storage for wastewater for use in emergency situations.

- 1983--Completed nitrogen-blanketed oil bath wash system for LPG treatment to eliminate penta crystal blooming on treated material.

- 1983--Installed waste heat pole dryer, which further reduced wastewater accumulation from boultonizing cycle for poles and piling.

PRELIMINARY INVESTIGATION RESULTS

In September 1983, four soil borings/groundwater monitoring wells were constructed to determine subsurface conditions at the plantsite. Well locations are shown on Drawing No. 2.

Monitoring Well-A (MW-A) is located at the north end of the site. It is believed to be up gradient and therefore represents background groundwater quality. Monitoring Well-B (MW-B) is located at the southeast corner of the site upriver and away from any of the process and chemical storage areas. It also represents background groundwater quality. Monitoring Well-C (MW-C) is located in the process area adjacent to the tie plant, and about halfway between MW-A and the Willamette River. Monitoring Well-D (MW-D) is located in the northwest corner of the site. It is believed to be down gradient of a discontinued waste sludge disposal area.

The disposal area has been reported to be approximately 40 feet by 75 feet. This area was used from 1968 to about 1970 for the disposal of boiler blowdown and sludge from the evaporator, settlers, and retorts. Since 1970, the boiler blowdown has been rerouted, and the sludge is hauled to the hazardous waste management facility at Arlington, Oregon. An estimate of the amount of waste material placed in the dump site has not been made, but will be included after further investigation.

A construction summary of the four wells is provided in Table 1. The elevations of the four wells were surveyed during January 1984.

The lithologic logs and soils classifications of the wells at various depths below the surface are provided in Table 2 through Table 5. As indicated in the tables, the soil is fairly uniform and is typical of dredge and fill material and wood residuals from the original sawmill.

Table 1
WELL CONSTRUCTION DATA

Date Drilled	MW-A 9/27/83	MW-B 9/27/83	MW-C 9/27-28/83	MW-D 9/28/83
Boring Diameter	7"	7"	7"	7"
Boring Depth	29'	29'	25'	32'
Casing Depth	27'	23'	24'	32'
Casing Diameter	2"	2"	2"	2"
Casing Material	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC	Sch 40 PVC
Perforated Interval	22'-27'	18'-23'	19'-24'	27'-32'
Perforation Thickness	0.02"	0.02"	0.02"	0.02"
Filter Pack Material	1 mm sand	1 mm sand	1 mm sand	1 mm sand
Filter Pack Interval	22'-29'	16'-29'	18'-25'	25'-32'
Annular Seal Depth	10'	16'	4'	15'
Annual Seal Material	Bentonite slurry with 5 sacks cement per yard			

Source: Aqua Resources, Inc.

Table 2
MW-A SUMMARY BORING

Depth Below Surface (ft)	Lithologic Description	Soil Classification
0	Brown medium sand; some 1/4-inch gravel	SP
5	Brown medium sand; no gravel	SP
10	Brown medium sand; no gravel	SP
15	Brown medium sand; no gravel; moist at 18 feet	SP
20	Gray-black medium sand	SP
20.5	Gray-black sandy silt with some organics	
23	Black clayey silt on augers	
25	Gray-black medium sand; some lenses/streaks of brown medium sand and gray-black silty fine sand; some organics	SP

Source: Aqua Resources, Inc.

Table 3
MW-B SUMMARY BORING

Depth Below Surface (ft)	Lithologic Description	Soil Classification
0	Medium gray-black sand, earth odor	SP
5	Medium gray sand with gravel to 1/2 inch	SP
	Gravelly medium brown sand with 1/4-inch gravel; earthy odor	
10	Gravelly black medium sand	SP
15	Brown medium sand; no gravel	SP
20	Organics--bark and wood chips	PT
25	Organics--bark and wood	PT
25	Clayey silt with organics (bark and wood)	OL

Source: Aqua Resources, Inc.

Table 4
MW-C SUMMARY BORING

Depth Below Surface (ft)	Lithologic Description	Soil Classification
0	Brown fine-medium sand	SP
5	Brown fine-medium sand	SP
10	Brown fine-medium sand, moist	SP
15	Brown and black, medium coarse sand; bottom 8 inches saturated (water)	SP
20	Medium sand, saturated	SP

Source: Aqua Resources, Inc.

Table 5
MW-D SUMMARY BORING

Depth Below Surface (ft)	Lithologic Description	Soil Classification
0		SP
5	Brown medium sand--dry	SP
10	Brown medium sand--dry, very loose	SP
15	Brown, gray, and white medium sand--dry, very uniform	SP
18	Auger cuttings--medium sand with oily sheen, strong creosote odor	SP
20	Brown, gray, and white medium sand--moist, some creosote odor	SP
25	Brown, medium sand--oily sheen, strong creosote odor	SP
30	Medium sand--saturated with black oil, strong creosote odor	SP

Source: Aqua Resources, Inc.

GROUNDWATER QUALITY

A summary of the chemical analyses of groundwater from the four wells is provided in Table 6. A discussion of these results follows.

The levels of copper, chromium, and arsenic in MW-A and MW-B, while relatively high for background, are most likely not a result of McCormick & Baxter's facility. Based on the soil analyses presented later in this report, we believe these are representative background levels. This conclusion is based on the following information:

- Both wells are located in areas of no known chemical storage, processing, or application; storage of treated poles; or dumping of wastewater or waste materials.

- Neither well had significant levels of oil and grease, creosote, or pentachlorophenol, which are normally associated with a wood-preserving facility.

- The soil analyses with depth for both wells showed fairly homogenous levels of copper, chromium, and arsenic; insignificant levels of oil and grease; and no detectable creosote (indicator compounds) or pentachlorophenol. The uniformity with depth is inconsistent with a surface source.

The analytical results show that levels of copper, chromium, arsenic, oil and grease, pentachlorophenol, and creosote in MW-C are relatively similar to those of MW-A and MW-B. Even though these results are similar, we believe they may not be representative of the groundwater. We believe that MW-C is

Table 6
GRODNDHATER QUALITY

Sample Location (I.D.)	MW-A			MW-B		MW-C		MW-D		Process Well	Stormwater Outfall
Sample Date	11/29/83[a]	11/30/83[a]	1/18/84[b]	11/30/83[a]	1/18/84[b]	11/30/83[a]	1/17/84[b]	11/30/83[a]	1/17/84[b]	1/17/84[b]	1/17/84[b]
Parameter (mg/L)											
Copper	0.08	0.25	0.44	0.07	0.10	0.06	0.09	0.74	1.30	0.03	2.97
Chromium (total)	0.04	0.14	0.21	0.04	0.06	0.03	0.05	14.0	6.94	<0.05	0.62
Arsenic	0.034	0.18	0.023	0.05	0.066	0.052	0.033	0.18	0.450	<0.005	1.12
Oil & Grease	<10	<10	<10	<10	<10	<10	<10	19,000[c]	6,890	<10	121
pH			6.9		6.8		7.5		6.8	7.6	6.6
Total Dissolved Solids	1,300	200	249	1,200	609	180	315	170	512	307	381
Nitrate (as N)	0.16	1.35	2.16	4.64	0.119	0.98	0.420	2.22	<0.0S	2.60	0.560
Ammonia (as N)	0.5	1.4	0.04	0.9	0.10	<.01	<0.02	0.4	<0.02	<0.02	<0.02
Conductivity			370		760		260		620	307	148
Pentachlorophenol	<.002	<.002	<0.2	<.002	<0.2	<.002	<0.2	150[c]	25.4	<0.2	1.9
Creosote[d]	<.005	<.005		<.005		<.005		620			
PAHs[e]			<0.01		<0.01		<0.01		715	<0.01	1.9

[a] Source: Aqua Resources, Inc.

[b] Source: CH2M HILL, INC.

[c] Results questionable due to down well sampling techniques.

[d] Creosote analysis based on the range of six indicator compounds: Naphthalene, Acenaphthylene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene.

[e] Arithmetic sum of principal indicator compounds.

being affected by leaking condensate return lines buried approximately 50 feet away. This conclusion is based on the temperature of the well water (69°F), and the pH of the groundwater.

The MW-D results showed the highest levels of copper, chromium, arsenic, oil and grease, pentachlorophenol, and creosote. MW-D's proximity to the discontinued waste dump area leads us to believe that this is the source of contamination.

In addition to the four groundwater monitoring wells, a sample was taken from the newest process well supply system in January 1984 and analyzed for the same parameters as MW-D. Analysis results are shown in Table 6. The levels of oil and grease, pentachlorophenol, and creosote (indicator compounds) were either nondetectable or at insignificant levels.

SOIL ANALYSIS

In September 1983, during construction of the four groundwater monitoring wells, soil samples were taken at approximately 5-foot intervals and analyzed for copper, chromium, arsenic, oil and grease, creosote, and pentachlorophenol. The results are summarized in Table 7. Soil sample results appear to correlate with groundwater quality. MW-A and MW-B soil samples show no presence of creosote or pentachlorophenol and less than 0.1 percent of oil and grease. MW-C soil samples indicate some minor levels of pentachlorophenol. MW-D soil samples support the presence of oil and grease, creosote, and pentachlorophenol from 20 to 30 feet (the total well depth). The depth of contamination below 30 feet is unknown.

Table 7
SOIL QUALITY

Sample Point	Depth (feet)	Copper (mg/kg)	Chromium (mg/kg)	Arsenic (mg/kg)	Oil & Grease (%)	Creosote PAHs (mg/kg)	Penta-chlorophenol (mg/kg)
MW-A	0	24	16	<6	<0.1	--	ND
	5	15.3	14.3	6	<0.1	ND	ND
	10	15.8	14.1	12	0.1	ND	ND
	15	16.2	13.8	8	<0.1	ND	ND
	20	23.1	17.9	13	<0.1	ND	ND
	25	13.5	10.3	<4	<0.1	ND	ND
MW-B	5	14.5	11.0	8	<0.1	ND	ND
	10	15.8	12.6	12	<0.1	ND	ND
	15	15.9	13.8	11	<0.1	ND	ND
	20	1.5	1.9	<4	<0.1	ND	ND
	25	12.6	13.2	7	<0.1	ND	ND
MW-C	5	14.8	13.3	5	<0.1	ND	1.4
	10	14.8	12.4	10	<0.1	ND	0.3
	15	13.5	9.8	7	<0.1	ND	0.5
W-D	5	18.8	14.0	16	<0.1	ND	0.6
	10	15.0	12.6	10	<0.1	ND	ND
	15	15.6	13.2	7	<0.1	ND	ND
	20	16.8	13.8	10	<0.1	ND	ND
	25	14.7	16.6	5	0.26	90	2,400
	30	17.2	29.4	<4	2.04	250	10,000
SS-1	<2	7.46	4.05	2.96	215	1.3	<5
SS-2	<5	53.1	9.72	27.1	1,022	13	26.5
SS-3	<4	12.4	7.77	7.66	256	1.6	<5
SS-4	<3	9.67	5.86	4.09	229	2.0	<5

Source: Aqua Resources, Inc.
Notes: < means none detected, sensitivity as indicated.
ND means none detected.
Creosote detection limit 1 mg/kg.
Pentachlorophenol detection limit 0.1 mg/kg.
All results are based on wet soil weight.

In mid-January 1984, additional soil samples were taken along the river bank. The locations of these soil sample (SS) points are shown in Drawing No. 2. SS-A was taken just below the cooling water outfall (NPDES Permit outfall identification 001). SS-B was taken approximately 25 feet below the stormwater outfall during a period when the surface was frozen and there was no flow from the outfall. SS-C was taken approximately 115 yards upstream from the first railroad abutment north of the river. SS-D was taken approximately 25 yards upstream from the first railroad abutment north of the river. Except for SS-B, the results are fairly consistent and do not appear to reflect the level of potential contamination as shown by MW-D results. SS-B levels appear to be directly affected by the plant's surface water outfall.

GROUNDWATER FLOW

In mid-January 1984, water elevation recorders were installed on MW-A, MW-C, and MW-D and in the Willamette River adjacent to the barge mooring dock at McCormick & Baxter's plant. In addition, weekly level measurements were taken at MW-B. Current data are insufficient to develop groundwater gradient profiles; however, MW-B and MW-D levels follow the change in river elevations. MW-C showed no fluctuation in water level, which is probably the result of interference from leaking condensate return lines buried some 50 feet away from the well. MW-A (farthest from the river) has shown little fluctuation; however, the river level has not experienced significant change in fluctuations during the same time period.

Based on a general understanding of the hydrogeology of the site, the anticipated shallow groundwater flow direction is

towards the river with a component in the direction of river flow.

SITE DRAINAGE

On January 17, 1984, a grab sample of the water being discharged from the storm sewer was collected and analyzed for the same constituents as the groundwater samples. The results are presented in Table 6. Based bn this one-time grab sample, the stormwater outfall warrants further investigation.

PROPOSED ADDITIONAL SITE INVESTIGATION

OVERALL APPROACH

Based on the preliminary findings, we propose further investigation of the stormwater outfall and the discontinued waste dump. Before assessing appropriate remedial action or cleanup measures, additional site investigation is necessary. Such investigation will provide more detailed characterization of the site with respect to the type and extent of contamination that may be present.

The additional site investigation will consist of: 1) installing additional groundwater monitoring wells/soil borings, 2) monitoring the water quality of the stormwater outfall, and 3) monitoring the surface oil bubbles in the stiffleg area. The proposed site investigation program, including a work schedule, is discussed in detail in the following sections:

GROUNDWATER MONITORING WELLS

The objectives of expanding the initial groundwater monitoring investigation are to:

1. Verify that the source of contamination at MW-D is the discontinued waste dump area

2. Determine the extent of contamination

3. Obtain additional groundwater information associated with plant activities (e.g., storage tanks, retorts, and discontinued pole wash)

4. Characterize the rate and direction of groundwater flow within the site

DRILLING AND MONITORING WELL CONSTRUCTION

Seven additional monitoring wells will be installed on McCormick & Baxter property. Three wells are intended to determine the extent of contamination (MW-E, MW-F, and MW-G). The other four wells are proposed to assess the presence of groundwater contamination from storage tanks, retorts, pole wash, and treated pole storage. MW-H will be located adjacent to retort No. 1. MW-I will be located adjacent to the storage tank farm. MW-J will be located in the center of the discontinued pole wash area. MW-K will be located in an active treated pole storage area. Proposed well locations are shown in Drawing No. 2. The expected depth of the wells will be between 25 and 75 feet. A detailed description of the monitoring well construction follows.

A hollow-stem auger or cable tool drilling rig will be used for drilling and sampling of the boreholes. Soil samples will be collected continuously at each borehole, using a split-spoon drive sampler. A hydrogeologist will log, package, and preserve all samples collected.

Strict decontamination procedures will be followed. All drilling and sampling equipment in direct contact with soils to be sampled will be decontaminated. Drill tools and samplers will be decontaminated by steam cleaning before drilling and between each borehole. Split-spoon samplers will be decontaminated between samples by washing in detergent, double rinsing in clean water, and a final rinse with methanol.

Collected soil samples will be packaged in methanol-rinsed, 8-ounce, mason-type jars with Teflon liners in the caps, and delivered to the CH2M HILL laboratory in Corvallis, Oregon, within 48 hours. They will be preserved by freezing and held until individual samples are selected for analysis. Handling of the samples will observe CH2M HILL chain-of-custody procedures.

The monitoring wells will be constructed with 4-inch steel casing and screen. The potential presence of creosote, penta, and oil in the subsurface precludes the use of PVC casing. The annular space between the borehole wall and the well screen will be packed with gravel and sand. Cement grout will be installed in the annular space between the borehole wall and the well casing.

The well heads will be completed with a 6-inch-diameter steel casing and locking cap set in concrete as a permanent protective cover for the monitoring wells.

AQUIFER TESTING, SURVEYING, AND WATER LEVEL MEASUREMENTS

Aquifer Testing

Short-term (±4-hour) aquifer tests will be run in each completed monitoring well to determine aquifer hydraulic properties. The aquifer tests will be run using pump-out techniques.

Water Level Measurements

A measuring point on the well head will be surveyed to within ±0.02 foot of actual elevation. The measuring point will then be used to determine water table elevations.

Horizontal well locations will be map-spotted and located within ±3 to 4 feet.

WATER QUALITY SAMPLING AND ANALYSIS

Water samples will be collected from each well and analyzed for TDS, pH, copper, arsenic, total and hexavalent chromium, pentachlorophenol, and indicator compounds for creosote. Portions of the samples will be saved for possible further testing. Sample collection will follow purging of the well until the specific conductance and temperature stabilize to ensure that a representative sample is collected. Depending on well yield, we expect the amount of purged water will not exceed 10-well volumes. Purging will be accomplished using a submersible pump capable of producing 5 to 15 gpm.

SOIL ANALYSES

Soil samples will be collected continuously at MW-E, MW-F, and MW-G, each borehole. The split-spoon drive will provide composite samples for each 5-foot interval. The field geologist will collect a representative sample portion from each 5-foot interval in 8-ounce jars as described previously.

STORMWATER OUTFALL

The water quality of the stormwater outfall will be measured weekly. The flow will be estimated on a daily basis. Grab samples will be obtained and analyses performed in CH2M HILL's Corvallis laboratory. Laboratory analyses will include copper, total chromium, arsenic, oil and grease, pH, TDS, pentachlorophenol, and indicator compounds for creosote.

MONITOR SITE RIVER FRONTAGE

Twice daily observations will be made along McCormick & Baxter's river frontage for the presence of oil bubbles rising to the surface. The observations will be above, below, and within the stiff-leg area. These observations will be recorded in a log book along with fluctuations in the river level.

ANALYSIS OF SITE INVESTIGATIONS

REPORT PREPARATION

The methods, results, and conclusions of the groundwater, soil borings, and surface runoff site investigation will be compiled and published in a draft final report. The report will recommend specific alternatives for remedial measures, define additional study needs, and describe the contamination. Interim monthly status reports will be submitted to the Department of Environmental Quality.

Specifically, the final report produced from the site investigation program will include:

- A summary of hydrogeologic conditions at the site
- An assessment of the extent of contamination
- Recommendations for additional investigation, or for remedial actions if significant contamination is found

- A detailed map showing groundwater elevation, locations of monitoring wells, groundwater flow directions, and water quality data

PROJECT SCHEDULE

The anticipated project schedule is shown below. Week Zero represents the time that approval is received from DEQ. Approximately 2 weeks' lead time is required to have a drilling contractor onsite to begin work. Laboratory analyses normally require a 4-week turnaround period.

WORK SCHEDULE

Step	Week 0	2	4	6	8	10	12	14	16	18	20	22	24
1. Groundwater wells (includes contractor procurement)	———												
2. Storm water outfall sampling and analysis	———												
3. Laboratory analyses			———										
4. Data analyses, technical memorandum, DEQ review				———									
5. Laboratory analyses									———				
6. Data analysis and draft final report											———		
7. Status reports to the DEQ			—		—		—		—		—		

STATE ENGINEER
Salem, Oregon

Well Record

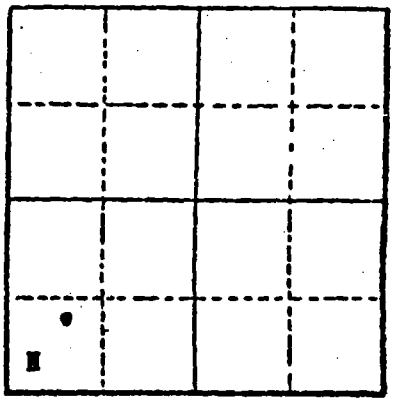
STATE WELL NO. 1N/1-7N
COUNTY Multnomah
APPLICATION NO. GR-4270

OWNER: MsCormick & Baxter Creosoting Co. MAILING ADDRESS: P. O. Box 3344

LOCATION OF WELL: Owner's No. CITY AND STATE: Portland, Oregon

SW ¼ SW ¼ Sec. 7 T. 1 N. R. 1 E. W.M.

Bearing and distance from section or subdivision corner North 13° 38.6' West 4215.6 feet to NW Corner, Section 7.



Altitude at well 20 feet

TYPE OF WELL: Drilled Date Constructed Sept. 1945

Depth drilled 130 feet Depth cased 130 feet

Section 7

CASING RECORD:

12-inch casing set from 0 to 150 feet

RECEIVED
JAN 1 '54
Water Quality Division
Dept. of Environmental Quality

FINISH:

casing perforated froa 65 to 124 feet
size of perforations not known

AQUIFERS:

eand, gravel, and clay

WATER LEVEL:

23 feet

PUMPING EQUIPMENT: Type Lane Bowler Deep Well Turbine Pump H.P.
Capacity 750 G.P.M.

WELL TESTS:

Drawdown 0 ft. after hours 1200 G.P.M.

Drawdown 8 ft. after hours 1300 G.P.M.

USE OF WATER Industrial Temp. °F. 19
SOURCE OF INFORMATION GR-4121
DRILLER or DIGGER R. J. Strasser Drilling Co. Portland, Oregon
ADDITIONAL DATA:
Log x Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

dredged sand	12 to 118	eocented grarel	13 to 12
silt, olay and very fine sand	48 to 70	grarel with a little watsr	5 to 7
coarse sand vlth water	24 to 46	cenented grarel	7 to 0
grarel with clay binder	21 to 25		

STATE ENGINEER
Salem, Oregon

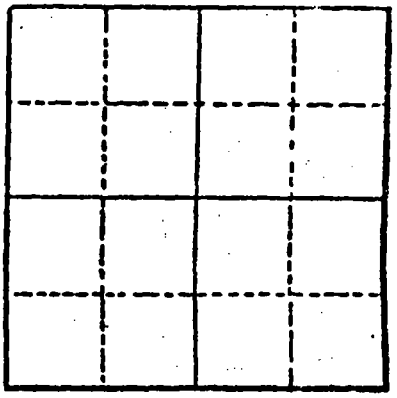
Well Record

STATE WELL NO. 1N/1-7BC
COUNTY Multnomah
APPLICATION NO. .....

OWNER: McCormick & Baxter Co. MAILING ADDRESS: .....

LOCATION OF WELL: Owner's No. ..... CITY AND STATE: .....

..... ¼ ..... ¼ Sec. ..... T. ..... N. S., R. ..... E. W., W.M.



Bearing and distance from section or subdivision corner .....

.....

.....

.....

Altitude at well 30

TYPE OF WELL: Drilled Date Constructed .....

Depth drilled 130 Depth cased 130

Section .....

CASING RECORD:

12 inch

FINISH:

AQUIFERS:

Sand (Younger alluvium) from 60 to 84
Gravel (Troutdale Formation) from 118 to 123

WATER LEVEL:

23 feet below land enrface, Septealer, 1945

PUMPING EQUIPMENT: Type Turbine H.P. .....
Capacity ..... G.P.M.

WELL TESTS:
Drawdown ..... ft after ..... hours ..... G.P.M.
Drawdown ..... ft after ..... hours ..... G.P.M.

USE OF WATER Icdustrial Temp. ..... °F. ....., 19.....
SOURCE OF INFORMATION USGS
DRILLER or DIGGER .....
ADDITIONAL DATA:
Log X Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:

Pumped 1,600 gpm, drawdown 26 feet.
Perforated casing 65-84, 94-104, and 116-124 feet.

STATE ENGINEER
Salem, Oregon

State Well No. 1N/1W-7N1
County MULTNOMAH
Application No.

Well Log

Owner: McCormick & Baxter Co. Owner's No.

Driller: R. J. Strasser Drilling Co. Date Drilled 1945

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Artificial fill:			
"Dredged sand"	0	12	12
Younger alluvium:			
Silt, clay, and very fine sand	12	60	48
Sand, coarse, water-bearing	60	84	24
Gravel and clay	84	105	21
Troutdale Formation:			
Gravel, cemented	105	118	13
Gravel, water-bearing	118	123	5
Gravel, cemented	123	130	7

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print) (Please do not write above this line)

State Well No. 1N/1-7N

State Permit No.

(1) OWNER:
Name McCORMICK AND BAXTER CO.
Address 6900 N. EDGEWATER ROAD PORTLAND, OREGON

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☒
If abandonment, describe material and procedure in Item 11.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☒ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

CASING INSTALLED:
Threaded ☐ Welded ☐
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....

PERFORATIONS:
Perforated? ☐ Yes ☒ No.
Type of perforator used
Size of perforations in. by in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☒ No
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(8) WATER LEVEL: Completed well.
Static level ft. below land surface Date
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
- - - -
- - - -
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

(10) CONSTRUCTION:
Well seal—Material used .....
Depth of seal ..... ft.
Diameter of well bore to bottom of seal ..... in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth .....
Was a drive shoe used? ☒ Yes ☐ No
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☐ No Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

(11) LOCATION OF WELL:
County MULT. Driller's well number 4268
SE¼ SW¼ Section 7 T. 1N R. 1E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing .....
Depth drilled 219 ft. Depth of completed well ft.
Formation. Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
FILL SAND	0	17	
BROWN SAND AND SILT	17	51	
BROWN SAND	51	60	
GREY SAND AND SILT	60	145	
PACKED SAND	145	161	
SAND AND SILT	161	219	

ABANDONED AND BACKFILLED WITH BENTONITE SEAL TO PREVENT MOVEMENT OF WATER

Work started DEC 20 1967 Completed JAN 17 1968
Date well drilling machine moved off of well JAN 18 1968

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Jim Johnson (Drilling Machine Operator) Date 2/16 1968
Drilling Machine Operator's License No. 57

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME R.T. STRUSSER DRILLING (Person, firm or corporation) (Type or print)
Address 8110 SE SUNNYSLOPE PORTLAND 97266
[Signed] Robert L. Strasser (Water Well Contractor)
Contractor's License No. 10 Date Feb 15 1968

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT

STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 1N/1-7 AAN

State Permit No. G-4242

RECEIVED
FEB 6 1968
STATE ENGINEER
SALEM, OREGON

(1) OWNER:
Name McCORMICK AND BAXTER Co
Address 6900 N. EDGEWATER ROAD PORTLAND OREGON

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 11.

(3) TYPE OF WELL:
Rotary [ ] Driven [ ]
Cable [X] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [X] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

CASING INSTALLED:
Threaded [ ] Welded [X]
12" Diam. from 0 ft. to 71 ft. Gage .330
12" Diam. from 91 ft. to 95 ft. Gage .330
" Diam. from ft. to ft. Gage

PERFORATIONS:
Perforated? [ ] Yes [X] No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? [X] Yes [ ] No
Manufacturer's Name EDWARD E. JOHNSON
Type ARMCO IRON Model No.
Diam. 12 Slot size 100 Set from 71 ft. to 91 ft.
Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.
Static level 25 ft. below land surface Date 2/1/68
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? [X] Yes [ ] No If yes, by whom? STRASSER
Yield: 1030 gal./min. with 18 ft. drawdown after 6 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 57° Was a chemical analysis made? [ ] Yes [X] No

(10) CONSTRUCTION:
Well seal—Material used CEMENT
Depth of seal 23 FEET ft.
Diameter of well bore to bottom of seal 20 in.
Were any loose strata cemented off? [ ] Yes [X] No Depth
Was a drive shoe used? [X] Yes [ ] No
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [X] Yes [ ] No Size of gravel 1/4-1/8
Gravel placed from 55 ft. to 95 ft.

(11) LOCATION OF WELL:
County Multnomah Driller's well number 4/3 69
SW 1/4 SW 1/4 Section 7 T. 1N R. 1E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing
Depth drilled 95 ft. Depth of completed well 95 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
FILL SAND	0	12	
SAND AND GRAVEL	12	23	
SAND AND SILT	23	65	
FINE SAND	65	70	
COARSE SAND	70	95	

Work started JAN 18 1968 Completed FEB 6 1968
Date well drilling machine moved off of well FEB 7 1968

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] E. M. Johnson (Drilling Machine Operator) Date FEB 15 1968
Drilling Machine Operator's License No. 57

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME R.J. STRASSER DRILLING Co (Person, firm or corporation) (Type or print)
Address 8110 SE SUNSET LANE PORTLAND ORE.
[Signed] Robert L. Strasser (Water Well Contractor)